



# Implementation of HELCOM's Baltic Sea Action Plan (BSAP) in Finland

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## Forewords

In Finland we have long traditions in the water and marine protection. The first water protection targets to 2005 were adopted already 1998. Since that several national programs with special targets has been adopted. This report describes shortly the measures taken and planned in Finland to implement the requirements of the HELCOM Baltic Sea Action Plan in its all major segments. According to our evaluation good progress has been made in several areas such as environmental protection on maritime activities, conservation of biodiversity and emission reductions from point sources. However, especially phosphorus loading seems to be most problematic and requires intensified and targeted actions. More work need to be done with e.g. agricultural nutrient and scattered waste water load.

Finland is committed to work further nationally and under the HELCOM framework to reach the good environmental status of the Baltic Sea.

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# I. The HELCOM Baltic Sea Action Plan

The status of the Baltic Sea has deteriorated dramatically over the last 100 years. Eutrophication poses the greatest threat to the Baltic. In addition, concentrations of hazardous substances have led to loss of biodiversity, evident in, for example, the decline in economically significant fish stocks. The Baltic Sea is also threatened by increased shipping traffic and the accompanying increased risk of oil disasters, as well as other risks and emissions caused by shipping traffic. Moreover, the Baltic Sea is vulnerable to climate change, the full impact of which remains largely unknown.

On 15 November 2007, in Krakow, Poland, the Baltic Marine Environment Protection Commission (known as the Helsinki Commission, or HELCOM) approved the Baltic Sea Action Plan (BSAP). The members of the commission include representatives of all countries along the shore of the Baltic Sea, as well as representatives of the European Union. The BSAP expects all participating countries to draw up national action plans by 2010. Simultaneously, another target of the action plan is to achieve a good environmental status for the Baltic Sea by 2021. The BSAP programme includes 150 distinct measures.

The main sections of the action plan tackle four themes: eutrophication, hazardous substances, the protection of biodiversity, and marine traffic.

## Eutrophication

Eutrophication is one of the most critical problems facing the Baltic Sea. Over the last 100 years, the Baltic Sea has been transformed from an oligotrophic, clear-water sea into a eutrophic marine environment. The overall goal of HELCOM is to render the Baltic Sea unaffected by eutrophication.

The key causes of eutrophication include excessive nitrogen and phosphorus loads, which enter the Baltic Sea from the contracting countries as well as others in the Baltic catchment basin. Approximately 75% of the Baltic Sea's nitrogen load, and at least 95% of its phosphorus load, is discharged into it either through rivers or as loads disseminated directly by water. Roughly 25% of the Baltic Sea's nitrogen load originates as airborne load.

## Ecological targets

The action plan's target is to achieve a good ecological status for the Baltic Sea. Under the plan, the following ecological targets have been set:

- nutrient concentrations close to natural levels
- clear water (with Secchi depth used as an indicator)
- a natural level of algal blooms
- natural distribution and occurrence of plants and animals
- natural oxygen levels

The status of coastal waters greatly depends on local circumstances; the action plan does not include any provisions for local reviews or proposals for measures.

When the BSAP was under preparation, estimates were made of the maximum acceptable load that might still result in the Baltic Sea achieving a good status. The MARE NEST model was utilised in calculations resulting in 600,000 tonnes of nitrogen and 21,000 tonnes of phosphorus being set as the maximum allowed load. To achieve this goal, an emission reduction target has been set for each country. National load figures for the years 1997–2003 were used as the baseline for emission reductions. For the Baltic Sea to attain a good ecological status by 2021, emission reduction measures must be carried out by 2016 at the latest. According to the estimates and criteria used by HELCOM, the Gulf of Bothnia does not suffer from eutrophication, which is why the action plan does not propose any load reduction measures for this area. On account of the model's technical features, the Archipelago Sea was also excluded from the survey.

Table 1: Maximum allowable inputs and the reductions needed

Sea area	Maximum allowable nutrient input (tonnes)		Inputs in 1997–2003		Reductions needed (tonnes)	
	Phosphorus	Nitrogen	Phosphorus	Nitrogen	Phosphorus	Nitrogen
Bothnian Bay	2,580	51,440	2,580	51,440	0	0
Bothnian Sea	2,460	56,790	2,460	56,790	0	0
Gulf of Finland	4,860	106,680	6,860	112,680	2,000	6,000
Baltic Sea proper	6,750	233,250	19,250	327,260	12,500	94,000
Gulf of Riga	1,430	78,400	2,180	78,400	750	0
Danish straits	1,410	30,890	1,410	45,890	0	15,000
Kattegat	1,570	44,260	1,570	64,260	0	20,000
<b>Total</b>	<b>21,060</b>	<b>601,720</b>	<b>36,310</b>	<b>736,720</b>	<b>15,250</b>	<b>135,000</b>

Table 2: Nutrient load reduction targets, by country

	Phosphorus (t)	Nitrogen (t)
Denmark	16	17,210
Estonia	220	900
Finland	150	1,200
Germany	240	5,620
Latvia	300	2,560
Lithuania	880	11,750
Poland	8,760	62,400
Russia	2,500	6,970
Sweden	290	20,780
Border areas Joint areas *	1,660	3,780

\* areas of non-HELCOM member countries

The action plan's current environmental targets and nutrient emission reduction goals are preliminary in nature. Both environmental and nutrient load reduction targets will be reviewed at predefined times, taking account of the very latest information available from, for example, member countries, the latest Fifth Pollution Load Compilation for 2008, and data from national river basin management plans.

## 2. Finland's National Protection Programmes and Targets

Finland will implement the HELCOM action plan via government-approved targets and action plans, as well as current legislative measures. These national programmes set sea protection targets and present the measures required for achieving them. Moreover, river basin management plans in line with the EU's Water Framework Directive have been approved for each river basin management area. The river basin management plan for the river Kymijoki – Gulf of Finland covers the area in which HELCOM's action plan will be implemented. The river basin management plan for the district of Kokemäenjoki – Archipelago Sea – Bothnian Sea presents the measures through which the Archipelago Sea's water status will be improved.

### Finland's Programme for the Protection of the Baltic Sea

In 2002, the government of Finland made a decision-in-principle on protective measures for the Baltic Sea, compiled as Finland's Programme for the Protection of the Baltic Sea. The protection programme's targets include reducing the Baltic Sea's eutrophication as well as improving the status of its nature and water areas. Risks and damage related to the transportation of oil, chemicals, and hazardous substances must be reduced and the biodiversity of sea and coastal nature preserved.

The programme defines more than 30 ways to achieve its targets. For the next 10–15 years, the above-mentioned decision-in-principle calls for measures in both Finland and its neighbouring areas.

Moreover, in June 2005, the Ministry of the Environment approved the Action Plan for the Protection of the Baltic Sea and Inland Watercourses, which covers implementation measures for the Programme for the Protection of the Baltic Sea.

### Water protection policy outlines up to 2015

On 23 November 2006, the government of Finland made the decision-in-principle Water Protection Policy Outlines to 2015. This programme defines measures aimed at achieving good water status and preventing further deterioration. It applies to inland waters as well as coastal waters and

groundwater. The accompanying outlines support the creation of regional river basin management plans. They also support the implementation of the EU's Marine Strategy Framework Directive and the HELCOM action plan.

The measures required for the achievement of the targets set are divided into six main target areas. These areas are the reduction of nutrient loads causing eutrophication, the reduction of risks caused by hazardous substances, the reduction of damage caused by water resource and water level management, the protection of groundwater, the protection of the biodiversity of water ecosystems, and water restoration.

The most important target is to reduce the nutrient loads that cause eutrophication, which calls for reduced non-point pollution, specifically from loads generated by agriculture. By 2015, the nutrient loads from agriculture must be reduced by at least a third from the average levels for 2001–2005. Measures aimed at halving the nutrient loads from agriculture in the long term should be implemented as soon as possible. In order to reduce the wastewater loads from communities and fish farming, voluntary environmental targets will be agreed upon with the industries in question. The protection of groundwater will be boosted through drawing up of water protection plans for all important groundwater areas. In combination with the related funding needs, the legislative changes required will be assessed. In addition, the protection of minor water bodies needs to be developed through legislative measures. The appropriateness of water regulation, as well as means of reducing its negative effects, continues to be assessed. In particular, water restoration is being promoted in order to revive and strengthen migratory fish stocks.

### The government report on the Baltic Sea policy, 2009

The government's 2009 report on Finland's Baltic Sea policy outlines the government's measures aimed at improving the marine environment of the Baltic Sea, increasing the safety of marine traffic, and intensifying economic co-operation in the area.

The report focuses on those key measures for protecting the Baltic Sea that are most urgent from Finland's point of view. Eutrophication is the Baltic Sea's most serious problem. In the report, the government presents additional measures aimed, for example, at agriculture, with the objective of reducing the nutrient load generated by Finland.

The report also proposes measures for increasing the safety of marine traffic, preventing disasters, and improving readiness to combat oil spills.

### River basin management plans

The government of Finland has approved seven regional river basin management plans for mainland Finland for 2010–2015. These plans are aimed at achieving a good status for surface and ground waters by 2015, and at preventing these waters' further deterioration.

The plans deal extensively with various activities that alter waterways, such as industrial and communal waste waters, loads on waterways due to agriculture and forestry, and water resource management. Action is most urgently needed to reduce the nutrient loads that lead to eutrophication. Measures have been proposed to strengthen the management of agricultural nutrient emissions from approximately two thirds of the cultivated land area. Livestock manure will be utilised more efficiently, and the number of protected zones will be increased in both agriculture and forestry. Almost a thousand waterway sites have been put forward for restoration. Fish passages will be improved on approximately 150 sites. The drawing up and implementation of groundwater protection plans will be supported.

The measures presented in the plans will lead to significant improvements in water status. By 2015, good water status should be guaranteed or achieved in more than 90% of the lake area surveyed, approximately 70% of the total length of rivers, and over 40% of the total area of coastal waters. It is estimated that approximately 98% of groundwater will be of good status by 2015. All waters should have achieved a good status in 2027, at the latest.

Unlike the HELCOM protection programme, which pertains to open seas, the river basin management plans have the objective of achieving a good status for coastal waters. HELCOM and the river basin management plans define the target of 'good' status slightly differently. The BSAP calculations assume that a good status has been achieved if load targets are met. Consequently, these two evaluation methods cannot be treated as equivalent.

The implementation programmes for the river basin management plans will be completed by the end of 2010.

## Coastal strategy

Finland's coastal strategy was completed in the summer of 2006. This strategy is aimed at securing the vitality and biodiversity of coastal areas, mainly by applying existing steering tools in line with recommended principles. This strategy is based on the specific characteristics of Finland's coastal areas and the challenges they face.

The responsible parties and players, specified in Finland's Programme for the Protection of the Baltic Sea, will implement the protection programme and the action plan based thereon, in order to maintain and promote biodiversity in coastal areas. As specified, among other outcomes, the protection programme will seek the restoration and treatment of nature types typical of the Baltic Sea and the mitigation of damage caused by invasive species. Every effort will be made to restore the populations of threatened species. Key measures for preserving biodiversity include reducing the loads discharged into the Baltic, especially into the Gulf of Finland and the Archipelago Sea, and minimising environmental risks related to marine traffic and near-coast operations.

Through the 2007–2010 action plan for biodiversity, the Ministry of the Environment promotes meeting of the targets set for the diversity of marine and coastal areas, as well as handling of issues related to integrated coastal zone management. When drawing up regional integrated coastal zone management strategies and action plans that adhere to the national coastal strategy, the Finnish regional councils, working with other players, take account of the issues of protection of coastal nature and propose measures for the preservation and promotion of biodiversity. Metsähallitus takes care of nature conservation areas and the Natura 2000 areas that are the responsibility of the state. The biodiversity of coastal areas is preserved in co-operation with various research institutes. The biologically and culture-historically rich nature and landscape types formed as part of the archipelago's culture are being restored, particularly in at-sea national parks, other nature conservation areas, and biosphere areas. At the same time, further prerequisites are being met for the development of new services, especially in the area of tourism.

## The national strategy and action plan for the conservation and sustainable use of biodiversity

The National Strategy for the Conservation and Sustainable Use of Biodiversity, 2006–2016, was approved by the Finnish government in December 2006. It is a continuation of the 1997–2005 National Action Plan for the Biological Diversity of Finland. In addition to this strategy, Finland has an action plan in place for the conservation of biodiversity.

Strategic targets:

- promoting the conservation of biodiversity by developing the nature conservation area network, boosting the protection of species, and by forming an integrated part of the operations and planning of various industries
- generating and distributing research-based information for use in operations policies related to cost-efficient and adjustable biodiversity conservation and sustainable development
- promoting the conservation and sustainable use of biodiversity as an integrated part of the operations and planning of various industries
- ensuring extensive co-operation between the relevant ministries and other players
- promoting the conservation and sustainable use of biodiversity globally, through international co-operation

## The EU's marine strategy

In 2008, the European Parliament and the European Council approved the Marine Strategy Directive, outlining the community's marine environmental policy. The aim is to achieve a good status for the marine environment by 2020. This directive covers the sea area from the limits of territorial waters towards the coast and up to the limit of the economic zone – i.e., towards the open sea from areas of interest included

in river basin management plans. By 2012, Member States must draw up national marine strategies for their marine waters (covering the current status, good status, and indicators) and, by 2015, an action plan. Marine strategies will be reviewed every six years. Member States are also required to co-operate and co-ordinate their activities with the other Member States responsible for the marine area.

In order to ensure the implementation of the Marine Strategy Directive, a group of experts will examine the definition and the knowledge base required for 'good' status. The drafting of national legislation has entered its final phases. At EU level, the directive's implementation is currently under review by groups of experts, task forces, a strategic co-ordination group, and a meeting of maritime leaders.

## Maritime spatial planning

A section of the EU's marine policy is devoted to maritime spatial planning. DG MARE has issued an announcement on maritime spatial planning, as well as a roadmap for its implementation within Member States and for territorial seas. Moreover, the European Commission will fund two maritime spatial planning pilot projects, in the Baltic Sea and the Bothnian Sea. In co-operation with VASAB (Vision and Strategies Around the Baltic Sea), which represents regional planning co-operation among countries surrounding the Baltic Sea, and some Member States, such as Sweden and Finland, HELCOM is in the process of applying for pilot funding from the commission. This is being done with the aim of testing how regional planning principles developed by the EU, HELCOM, and VASAB can be applied within the region of the Baltic Sea and the special Bothnian Bay case area between Finland and Sweden.

In Finland, municipalities and regional councils are responsible for the land use planning of their area, in line with the Land Use and Building Act. Since the regional territory of municipalities and regions extends to the limit of territorial waters, this law also applies to sea areas. With its participation and assessment procedures, the land use planning system corresponds to the needs of maritime spatial planning. In both regional plans and the municipalities' master plans, water area is allocated, for example, to nature conservation areas, wind power areas, sea sand dredging areas, various protected zones for shooting ranges, and ship routes. In economic zones or EEZs, the Finnish law on economic zones is applied.

## Co-operation with neighbouring areas within the Baltic region

In accordance with the Programme for the Protection of the Baltic Sea, and the co-operation agreements between Finland and Russia, Finland has been active in reducing the nutrient load of its neighbouring areas. Co-operation has focused on the Baltic catchment basin in north-western Russia. The primary goal of the co-operation is to reduce the eutrophication of the Gulf of Finland.

The water utility of St Petersburg is the project's key partner in Russia. In the summer of 2009, the 20th anniversary of this co-operation was celebrated with a seminar, which also witnessed the signature of a Memorandum of Understanding for further funding, worth €6.1 million, from Finland.

The most important co-operation project now being implemented is the so-called St Petersburg Neva Discharges Closure, which includes completing the main sewer tunnel, connecting direct discharges to the tunnel, and renovating existing wastewater treatment plants. The project will reduce phosphorus loads by 860 tonnes and nitrogen loads by 1,100 tonnes annually. After the project's implementation, 94% of the wastewater of St Petersburg will be treated in line with HELCOM recommendations. It is projected that the project will be completed in 2012. Finland aims to support this €320 million project with an investment grant of €6.1 million. Investments in nutrient removal carried out by small and mid-sized wastewater treatment plants in St Petersburg are also under preparation.

Environmental co-operation extends also to agriculture and, specifically, to the promotion of environmental protection in the livestock industry of the Leningrad region. Nutrients from the livestock industry are being discharged into waterways and the accumulation of manure on the terrain poses a severe threat to the status of the Gulf of Finland. In co-operation with the Northern Dimension Environmental Partnership Fund and NEFCO, Finland has sought potential solutions to the manure problems caused by poultry farms in particular.

The tripartite co-operation of Finland, Estonia, and Russia continues. These activities focus on marine traffic safety, improved capability to combat oil spills, and reduction in nutrient loads and hazardous substances.

The BSAP Fund, which supports the implementation of HELCOM's Baltic Sea Action Plan by financing BSAP-related project planning, has been established within the framework of the Nordic Investment Bank and the Nordic Environment Finance Corporation (NEFCO). In 2009, Sweden invested 45 million SEK in the fund, and it has invested the same amount for 2010. Finland's investment has so far amounted to €1.6 million of funds earmarked for activities in north-western Russia. The fund's goal is to speed up project planning and the acquisition of international funding, specifically for cost-effective investments to be implemented in Russia, Belarus, Ukraine, the Baltic states, and Poland.

## 3. Actions in Finland

### 3.1. Eutrophication

Both the HELCOM action plan and Finland's national programmes for the protection of the seas and waterways have stated that eutrophication is the single most severe problem threatening the good status of the Baltic Sea.

The BSAP has set a target for the reduction of eutrophication-causing emissions; estimates indicate that this reduction will result in good status. The overall target is to reduce phosphorus loads by approximately 40% and nitrogen loads by close to 20%. Contributions toward the reduction target have been divided among countries according to their sea area. Finland's target is to reduce the nitrogen load discharged to the Gulf of Finland by 1,200 tonnes and the phosphorus load by 150 tonnes from the levels of 1997–2003. There are no reduction targets set for the Gulf of Bothnia.

HELCOM's member states have committed themselves to drawing up programmes by 2010, taking up load-reducing measures by 2016, and attaining good status by 2021. In Finland, this is done through several national programmes.

The BSAP also presents a number of specified measures and recommendations, which are to be implemented either nationally or in co-operation with other member states and the secretariat.

#### Emissions via community wastewater

In accordance with Finland's Baltic Sea Protection Programme and the Action Plan for the Protection of the Baltic Sea and Inland Watercourses, the efficiency of nutrient removal from wastewater is to be improved, and the fulfilment of conditions for successful operation of treatment plants is to be enhanced, through application of the best technologies available at the time.

#### Organic matter

In 2006, organic matter was removed from Finland's waste waters with total effectiveness of 96.6%. HELCOM recommends that the removal rate for organic matter be at least 80%, depending on the number of inhabitants a wastewater treatment plant serves. Therefore, Finland exceeds HELCOM's recommendations for the efficiency of organic matter removal from community wastewater.

#### Phosphorus

In 2006, phosphorus was removed from Finland's wastewater with 95.4% effectiveness. HELCOM recommends that the removal rate for phosphorus be 70–90%, depending on the number of inhabitants the relevant wastewater treatment plant serves. Therefore, Finland more than meets HELCOM's recommendations for the efficiency of phosphorus removal from community wastewater.

#### Nitrogen

The need for nitrogen removal is determined case by case in the environmental permits of wastewater treatment plants, on the basis of the load and the characteristics of their area of impact. Loads are reduced with greater efficiency in those treatment plants with discharge points or wastewater impact areas in coastal or inland waters; where nitrogen, as a minimum nutrient, is more likely to cause eutrophication; and where a decreased nitrogen load will improve water status. Research indicates that the coastal areas to the south of Kvarken and toward the eastern end of the Gulf of Finland are predominantly, or at times, nitrogen-sensitive, which means that the nitrogen loads entering them need to be decreased in order for eutrophication to be reduced. If water remediation is required by the environmental permit, this is done in accordance with the Government Decree on Urban Waste Water Treatment (888/2006).

The HELCOM recommendations require nitrogen removal efficiency to be at least 70–80% or that nitrogen concentrations be below 15 mg/l where the PE is below 100,000 and below 10 mg/l where the PE is over 100,000 in nitrogen-sensitive areas. Treatment plants serving fewer than 10,000 inhabitants must have a nitrogen removal efficiency of at least 30%, or nitrogen concentrations of 30 mg/l in nitrogen-sensitive areas.

If the environmental permit so demands, according to the Finnish decree on urban wastewater, nitrogen removal efficiency rates must be at least 70%, or nitrogen concentrations 15 mg/l for a PE below 100,000 and 10 mg/l for a PE over 100,000. Nitrogen concentrations are allowed to reach a maximum of 20 mg/l during the time of the year when the wastewater processing temperature exceeds 12°. Additionally, 50% of the nitrogen load in wastewater of populations smaller than 10,000 needs to be removed. Finland, therefore, in essence adheres to HELCOM recommendations also for nitrogen removal. In 2006, nitrogen was removed from Finland's wastewater at an overall rate of 54.4%.

Nitrogen is removed in virtually all wastewater treatment plants around the Gulf of Finland and several of the plants by the Gulf of Bothnia. All major wastewater treatment plants on the southern coast, along the coast of the Gulf of Finland, or in the immediate vicinity of river waterways will remove nitrogen by 2010. As an example of the plants' efficiency, in 2005, 79.6% of all nitrogen was removed in the Uusimaa region. According to HELCOM's Baltic Sea protection action plan, there is no need for further measures in the Gulf of Bothnia; Finland, nevertheless, removes phosphorus and organic matter to a greater extent than is demanded by HELCOM's recommendations, in addition to removing nitrogen on a case-by-case basis (it is removed, for example, in Oulu, Kokkola, and Pori).

In Finland, the targets set by HELCOM for the purification of community wastewater have, in fact, been met where phosphorus and organic matter removal are concerned. Measures for the improved efficiency of nitrogen removal continue, so that the nitrogen removal targets (removal

efficiency of 70/50% in nitrogen-sensitive areas) set by Finland's Programme for the Protection of the Baltic Sea will be met by 2015. Waterworks have set targets for the reduction of leakage water by 2010 and 2020. Developments in the nutrient loads of sewerage systems are assessed annually. The river basin management plan for the river Kymijoki – Gulf of Finland proposes itemised measures for the further reduction of nitrogen emissions.

#### Wastewater management in sparsely populated areas

The HELCOM recommendation for wastewater management is implemented in Finland through the Land Use and Building Act (132/1999) and its associated decree (895/1999), the Environmental Protection Act (86/2000) and associated decree (169/2000), the Government Decree on Treating Domestic Wastewater in Areas Outside Sewer Networks (542/2003), and the Water Services Act (119/2001). In addition, river basin management plans present further measures for meeting set targets.

As defined in HELCOM's recommendations, the wastewater of sparsely populated areas must be treated such that emissions per inhabitant per day have maximum values of 8 g BOD, 0.65 g total phosphorus, and 10 g total nitrogen. In conformity with decree 543/2003, by 2014, 85% of the phosphorus, 40% of the nitrogen, and 90% of all organic matter found in wastewater from Finland's sparsely populated areas must be removed. A municipal environmental authority can decide to depart from the target schedules, or define lower-than-normal treatment requirements for a certain area, if improving the efficiency of wastewater treatment is inordinately expensive and the wastewater does not cause harm to the environment. Therefore, the reduction requirements of the Finnish decree (542/2003) are stricter than the HELCOM recommendations.

#### Replacing phosphate in detergents and dish-washing agents

Since 1990, Finland has voluntarily removed most of the phosphates from dish-washing agents and detergents. This has led to a significant reduction in the phosphorus load. Today, roughly 90% of all detergents on the market are phosphate-free. Finland will move ahead to phosphate-free detergents no later than in 2012. Banning detergents that contain phosphates will reduce phosphorus emissions by approximately 15 tonnes for all of Finland; some of this reduction will be seen in sea areas.

#### Reductions in agricultural emissions

In accordance with HELCOM targets, member states must include practicable and cost-efficient measures for agricultural emissions' reduction in their national programmes.

The most important target of the Water Protection Policy Outlines to 2015 programme, as well as the HELCOM Baltic Sea Action Plan, is the reduction of the nutrient loads that cause eutrophication. This calls for the reduction of loads from agriculture, in particular. All national water protection programmes – Water Protection Objectives up to 2005, Water Protection Action Plan up to 2005, Finland's Programme for

the Protection of the Baltic Sea (2002), and the Action Plan for the Protection of the Baltic Sea and Inland Watercourses (2005) – propose measures for water protection within the field of agriculture. The means and measures included in water protection outlines have become better defined, and their scope has been further specified in the river basin management plans, which also take into account regional needs.

The target of the Water Protection Action Plan up to 2005 programme was to halve the load from agriculture when compared to the levels of the early 1990s: according to the environmental targets of the Guidelines for Water Protection to 2015 programme, this target is still valid. If, however, the impact of social and economic influences is taken into account, reaching the target will require measures that go beyond 2015. The target is to reduce, by 2015, the nutrient loads from agriculture by at least a third from the average levels of 2001-2005.

In Finland, HELCOM recommendation 28E/4 on reducing agricultural emissions is realised through legislation, including, in addition to agricultural legislation, the Environmental Protection Act (86/2000), the Environmental Protection Decree (169/2000), and the government decree on the restriction of discharge of nitrates from agriculture into waters (931/2000). On the basis of the Environmental Protection Act, decrees that are essential for the prevention and reduction of environmental pollution may be passed. Municipalities can also issue environmental protection regulations. An environmental protection decree specifies that animal shelters are subject to licence. The decree does not, however, apply to crop farming. The Government Decree on Treating Domestic Wastewater in Areas Outside Sewer Networks (542/2003) specifies how, for example, waste waters from milk stores are handled. Other laws, international treaties, and programmes that promote the realisation of HELCOM's recommendations include the IPPC, agri-environmental subsidies, the Act on Plant Protection Products (1259/2006), the Water Act (264/1961), the Chemicals Act (744/1989), the Waste Act (1072/1993), and the decrees of the Ministry of Agriculture and Forestry. Additionally, a decree on good crop farming practices, and the framework directive Sustainable Use of Pesticides are in preparation.

River basin management plans, drawn up as required by the Water Framework Directive, present additional means for achieving good water status. The river basin management plan for the river Kymijoki – Gulf of Finland river basin management area proposes additional measures for the reduction of agricultural nutrient loads for all of Finland's waterways draining into the Gulf of Finland. The plan also presents several needs for improvement in steering methods.

Agri-environmental subsidies are included in the Rural Development Programme for 2007–2013. Joining the Agri-Environmental Support Scheme is voluntary, with approximately 94% of active farms and 98% of cultivated land area involved. Environmental subsidies are divided into basic and additional measures, on one hand, and special support contracts, on the other. The size of the subsidy is based on the loss of income involved and the costs caused by

the measures. The target of agri-environmental subsidies is to enable sustainable agricultural production in a way that puts less load on the environment than is done today, secures the conservation of rural biodiversity and cultural landscapes, and ensures meeting of the conditions for agricultural production also in the long term. The load on the environment can be reduced by, for example, increasing the utilisation of plant nutrients and reducing the risks caused by pesticide use. Another goal is to decrease the erosion of arable land, increase the humus concentration of the soil, preserve or improve the soil's production capability, and retain the versatility and quality of rural landscapes as a living environment.

*The 2009 Government Report on the Baltic Sea* agrees to develop agri-environmental subsidies in a manner that gives greater consideration to the protection of the Baltic Sea. The new environmental support contracts that enter into force during the agri-environmental subsidy commitment period of 2012 will boost measures by improving their targeting regionally and emphasising areas that are more risk-sensitive on water protection grounds. The majority of the water protection measures related to the agri-environmental subsidies that commence in 2014 will be targeted geographically and by farm to the areas and sectors that generate the greatest loads; also, the amount of targeted special subsidies will grow. To ensure that the impact on waterways is as comprehensive as possible, basic-level measures, which are compulsory for all beneficiaries of environmental subsidies, are also needed, and their efficiency in the area of water protection should be strengthened. Agricultural investment subsidy planning will also take into account the goals of water protection and guide investment subsidies to new measures that advance water protection in the livestock industry.

### 3.2. The Gulf of Finland River Basin Management Plan

The HELCOM action plan defines reduction targets for Finland's eutrophying emissions into the Gulf of Finland. Accordingly, annual nitrogen emissions must be reduced by 1,200 tonnes and phosphorus emissions by 150 tonnes in comparison to the average emissions of 1997–2008. The Kymijoki – Gulf of Finland river basin management plan covers these emission reduction measures. Measures included in the plan have been grouped into additional measures and measures that are already incorporated into current practices.

The most significant measures related to the current methods of community wastewater treatment include the extension of the sewerage network in planned areas, adding the wastewater of a further 74,300 inhabitants to its scope; the building of 260 km of new transfer sewers and of five new treatment plants; treatment plant renewal and improved efficiency; and sewer renovation. Additionally, the treatment plan includes 210 km of new transfer sewers and three new treatment plants. Emissions from sparsely populated areas are reduced in accordance with the Decree on Treating Domestic Wastewater in Areas Outside Sewer Networks. As a result of the decisions that are in line with current practices, community wastewater nitrogen

emissions to the Gulf of Finland have already decreased by 1,322 tonnes and will decrease by a further 124 tonnes. Correspondingly, phosphorus emissions have fallen by 20 tonnes.

In 2000–2006, the average phosphorus load from sparsely populated areas to the Gulf of Finland was approximately 80 tonnes. Calculations are based on the assumption that 65% of the load is retained in the catchment basin. If the retention for sparsely populated areas is increased to 85%, as stipulated by the decree, the load will decrease by 46 tonnes.

Emissions from *industry* are regulated by the terms of the environmental permit. Emission reduction is implemented with the best available technologies. Environmental permits require several wastewater treatment measures from industries. In South-East Finland, for example, 12 major industrial plants are in the process of improving their wastewater treatment. Nitrogen emissions from industries to the Gulf of Finland have decreased by 90 tonnes, and will continue to decrease – falling by a further 90 tonnes. Phosphorus emissions have decreased by 1 tonne and will decrease by a further 7 tonnes.

In line with current practices, agricultural emission reductions target both cattle farming and nutrients washed from cultivated land. The measures related to crop farming are mostly based on the Nitrate Decree and the supplementary terms of the EU's direct agricultural subsidies. A decree on good crop farming practices is being prepared, and the Nitrate Decree is under revision. Issues covered by the Nitrate Decree include manure storage, the erecting of barns for animals, and the creation of exercise yards. Moreover, recommendations are given on manure handling and spreading. Agricultural subsidy systems play a key role in the implementation of environmental protection within agriculture; their target is to enable agricultural and horticultural production that generates minimal load to the environment.

Current water protection measures reduce nutrient loads but do not suffice in all instances for achieving good water status. Key additional measures of the river basin management plans include

- 3,570 hectares of new protective zones
- 380 new areas of wetlands
- increasing plant coverage for cultivated fields in the wintertime by 156,000 hectares
- controlling nutrient emissions (optimal fertilisation and reduced fertilisation) for 252,000 hectares and improved control (better utilisation of manure) on 18,000 hectares.
- controlled subsurface drainage for 1,370 hectares
- farm-specific counselling for approximately 1,500 farms

The effect of the current and future measures within agriculture for reducing eutrophying loads is difficult to assess, and the impact on waterways will also become evident only after some time has passed. Reducing agricultural nutrient loads by at least a third has been the cornerstone of the river basin management plans. In 2001–2005, the agricultural load from the catchment basin of the Gulf of Finland was

approximately 278 tonnes of phosphorus and 5,305 tonnes of nitrogen. A reduction of one third would equate to emission of approximately 90–95 tonnes less phosphorus and 1,800 tonnes less nitrogen into the Gulf of Finland.

Forestry's share of the load to waters in the Gulf of Finland is relatively small. Proposed additional measures to be implemented include project-specific planning, more efficient utilisation of water protection measures, water protection boosted by drainage maintenance, and increased availability of training and guidance.

### 3.3. Estimated Developments Related to Eutrophying Emissions

Because of the efficient water protection measures implemented in the 1970s and 1980s, point loads eutrophying the Baltic Sea and inland waters have fallen to a fraction of their previous levels (see figures 1 and 2). The majority of the load has consisted of non-point load (as figures 3 and 4 show). Because of natural conditions (rain, washing away, and floods), controlling these load sources has turned out to be much more difficult than controlling point loads, and their reduction has not equalled that of the point loads.

Figure 1: Trends in phosphorus point load in waters

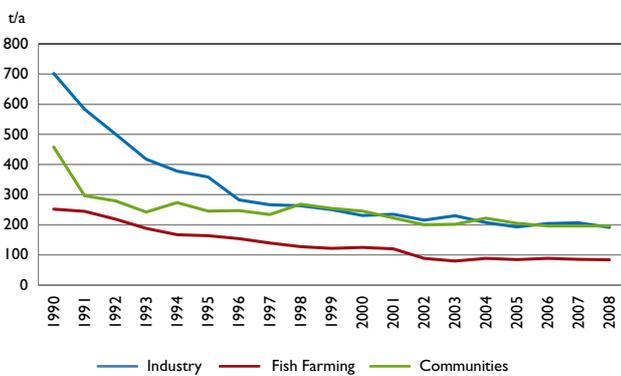


Figure 2: Trends in nitrogen point load in waters

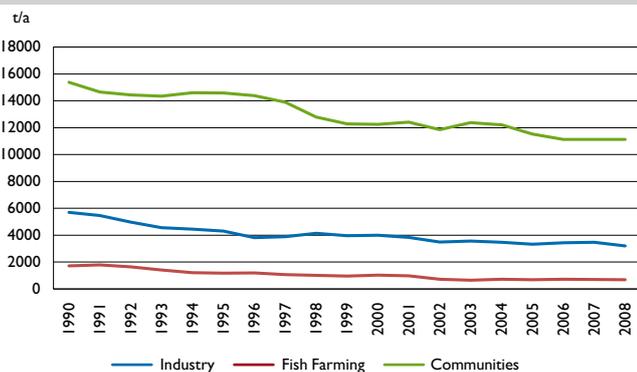


Figure 3: Different sources of phosphorus load to bodies of water in 2008

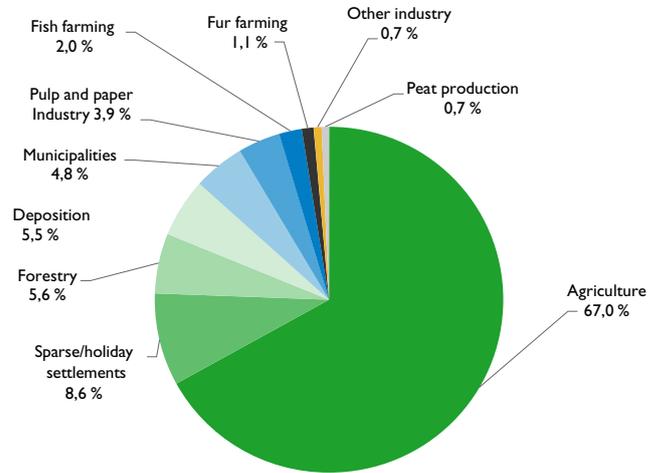
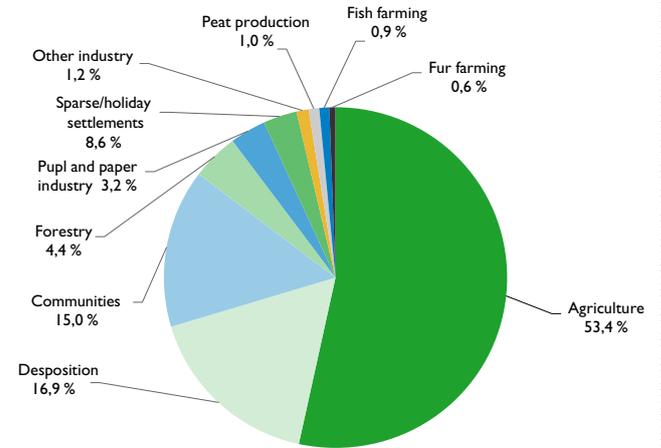


Figure 4: Different sources of nitrogen load to bodies of water in 2008



Trends of point loads can be estimated with fairly good reliability. Estimating agricultural load and other types of non-point load development is, by contrast, fairly unreliable. In light of the measures already implemented, as well as the future measures agreed upon and targets set in the river basin management plans, load developments can be presented in a calculation wherein the load discharged to the Gulf of Finland would develop according to the targets set in the HELCOM action plan (see Table 3).

Table 3: BSAP targets and the developments of eutrophication-causing load from Finland to the Gulf of Finland

	nitrogen from rivers (tonnes)	nitrogen deposition (tonnes)	phosphorus (tonnes)
Average load in 1997–2003	16,030		585
Greatest acceptable load	14,830		435
Preliminary reduction target (1997–2003)	1,200		150
Load on 1 Jan. 2007	15,500		573
Additional reduction needed after 1 Jan. 2007	670		138
<b>reduction achieved/achievable</b>			
Community water treatment plants	1,322/124		20/0
Industry + fish farming	90/90		1/7
• Wastewater from sparsely populated areas			1/46
• Target set for agriculture, minimum reduction of 1/3			/approx. 90–95

## 4. Hazardous substances

The national BSAP programme for hazardous substances drawn up by Finland (see appendix) is, for the most part, based on the targets and measures of Finland's national programme on dangerous chemicals, EU regulations, and international treaties to which Finland is committed. The majority of the hazardous substances prioritised by the BSAP either have been banned in Finland by EU regulations or are strictly controlled (organic tin compounds, PFOS, brominated flame retardants, short-chain chlorinated paraffins, endosulfan, mercury, and cadmium). If loads of such chemicals can still exist, the programme describes emission reduction measures and assumed emission sources and amounts for them. The programme also summarises the results of recent research on the prevalence of various chemicals in the Baltic Sea and references research projects now in progress (such as COHIBA).

The programme aims at identifying any deficiencies in the handling of chemicals prioritised by the BSAP and, more broadly, any deficiencies in the implementation of the action plan's section on hazardous substances in Finland. The recognised challenges in chemicals control include, for example, dangerous chemicals that may enter the country with imported products and equipment. Because of the wide variety of chemicals and countless product types, the monitoring operations of both customs and market surveillance authorities require significant amounts of resources and expertise. Waste flows and products made from recycled materials can also contain banned substances, used before the ban's entry into force. Energy-saving lamps, which contain mercury, have been identified as a specific target requiring special attention:

their selective collection must be improved, and consumers' awareness of this collection must be heightened. The European Union's new chemicals regulation (REACH) entered into force in 2007. With REACH, the procedures for assessing and eliminating the risks of chemical use were fundamentally revised; the new elements include the systematic collection of information on chemicals; descriptions of the safe use of chemicals; and, in addition to restrictions, permit procedures for the use of the most hazardous substances. Helsinki is the home of the European Chemicals Agency.

Management of the chemicals market and of the use of chemicals is in essence implemented through EU-wide and global measures. Managing the emissions generated by various types of chemical use is mainly handled with plant-specific environmental permits, in line with the IPPC directive, and takes into account local circumstances. Emissions are also limited by the EU's Water Framework Directive and the directive on emissions of harmful substances into waters. The Directive on Environmental Quality Standards in the Field of Water Policy (2008/105/EC) defines environmental quality standards for 33 substances in surface waters.

The protection of Finland's particular circumstances is also strengthened by the categorical bans, implemented through environmental legislation, on groundwater and sea contamination. The Marine Strategy Framework Directive (2008/56/EC), to be implemented in 2010, will also influence the use of harmful and hazardous substances.

Finland has been an active participant in the development and implementation of environmental treaties in the fields of chemicals and waste management. Finland has also had a high profile in the work done to enhance the synergies among three global chemical conventions (the so-called Basel, Rotterdam, and Stockholm conventions). Additionally, Finland is an active participant in the implementation of the Strategic Approach to International Chemicals Management Strategy, or SAICM. The goal of this strategy is to promote chemical safety globally. In addition to chemical-related environmental risks, the questions of consumer health and the occupational health of the labour force are taken into account.

The projects implemented, or ongoing, within the national chemicals programme include: developing the environmental monitoring practices associated with harmful substances (the HAASTE project); identifying the most important emission sources, total emissions, and the distribution of POP compounds; intensifying the obligatory monitoring of harmful substances from industrial sources, on the basis of the risks caused by emissions; and surveying the need for continuous monitoring of the harmful substances contained in sludge or urban wastewater. The target of the last project mentioned is to gain information on harmful substances that enter treatment plants, as well as the substances that end up in treatment plant sludge, and their effect on the utilisation of the sludge.

## 5. Conservation of Biodiversity

Biodiversity conservation in Finland is implemented through the national strategy and action plan for the conservation and sustainable use of biodiversity for 2006–2016, approved by the Finnish government. The target is to create a comprehensive, efficiently managed, and ecologically representative global conservation area network, consisting of national and regional conservation areas; the plan is to implement this by 2010 for nature on land and by 2012 for marine nature.

HELCOM's BSAP presents various protective measures that promote the conservation of sea and coastal landscapes in their natural state, thriving and stable plant and animal populations, and viable species populations.

### 5.1. Sea and Coastal Landscapes in their Natural State

The conservation area network and its efficiency

The aim for 2010 is to apply to the EU for the addition of five offshore areas to the Natura 2000 network. These areas will also be reported to HELCOM as BSPA areas. In 2009, the four-year EU LIFE+ project FINMARINET (inventories and planning for the marine Natura 2000 network in Finland) was initiated. The purpose of the project is to determine the habitat and species types of the seven existing marine Natura 2000 areas and collect information on certain EEZ areas for the purpose of adding new areas to the Natura 2000 network.

Drawing up of the management and use plans for the Natura areas began in 2006. Most of the management and use plans for the state-owned Natura areas that have increased demands for use have already been made. Of such areas, the management and use plans for the national parks of the Bothnian Bay, Kvarken, Rahja, the Archipelago Sea, and Tammisaari have been completed. The 2008 project on the assessment of threatened habitat types in Finland evaluated the developments and threat status of habitat types in the Baltic Sea and its coastal areas. On the basis of this project, conservation and treatment efforts can be targeted at the habitat types that need them most. In the autumn of 2009, a work group was established to prepare an action plan based on the results of the assessment of threatened habitat types.

The marine landscape

The EU-funded BALANCE project of 2005–2007 created the first comprehensive marine landscape maps of the Baltic Sea. Mapping of marine landscapes and the further development and improvement of modelling methods continues in the VELMU programme and the FINMARINET (EU LIFE+) project. The use of maps in planning work is promoted, with the target being to finalise landscape maps of significant marine Natura 2000 areas by 2012.

### 5.2. Thriving and Stable Plant and Animal Populations

In 2004, the Ministry of the Environment established the Finnish Inventory Programme for the Underwater Marine Environment (VELMU) in order to generate information on marine and coastal nature until 2014. Alongside inventory work, a classification system for underwater marine nature habitat types will be developed, taking into account national and international classification systems (such as the EU's EUNIS and the HELCOM red list). Finland is an active participant in all projects related to creation of unified classification systems for marine habitats and biotopes, both nationally and internationally.

Assessments of threatened habitat types and species

The assessment of threatened habitat types in Finland, which covered the assessment of the threat status of 12 underwater marine habitat types, was completed in 2008. In the autumn of 2009, a work group was established to prepare an action plan based on the results of this assessment of threatened habitat types. The next comprehensive assessment of threatened species will be completed in 2010.

The target of the VELMU programme is to create information for the next assessment of threatened habitat types. To the extent its resources allow, VELMU's work will continue throughout the sea area, creating distribution maps for species such as the bladderwrack, marine eelgrass, and the blue mussel. The FINMARINET project will also produce distribution maps for selected Natura 2000 areas. All information will be collected in a shared database, and the final map presentations will be delivered to HELCOM.

### 5.3. Viable Species Populations

Non-commercial fish

In Finland, the responsibility for regulating fish species is divided between two ministries. The Ministry of Agriculture and Forestry is responsible for commercial use of fish and the Ministry of the Environment for the 37 fish species, mentioned in the Nature Conservation Decree, to which the Nature Conservation Act is applied. The assessment of Finland's threatened species in 2000 included 66 fish species, of which 11 were deemed to be insufficiently known. The Ministry of the Environment, the Ministry of Agriculture and Forestry, the Finnish Environment Institute, and the Finnish Game and Fisheries Research Institute co-operate to clarify how the monitoring of fish stocks of low commercial value should be arranged.

The harbour porpoise and the impact of fishing on biodiversity

In line with the EU's nature directive and other agreements (such as the ASCOBANS agreement, the Jastarnia plan, and HELCOM's recommendations), it is Finland's responsibility to track harbour porpoise sightings in its territorial waters. Old and new sightings are entered in the species database (porpoise

register) maintained by the Finnish Environment Institute. Moreover, in 2006–2007, Finland completed a harbour porpoise observation programme, as stipulated by the EU, under the Ministry of Agriculture and Forestry.

The EU's Common Fisheries Policy includes various measures to mitigate the environmental impact of fishing. In 2007, the European Commission issued a statement to the European Council and Parliament with the goal of introducing a European fishing policy that reduces unwanted by-catches and, gradually, eliminates discards.

Since the beginning of 2008, drift netting in the Baltic Sea has been prohibited by Council Regulation 2187/2005. This reduces unwanted fauna (such as mammals and birds) being by-caught in the nets, especially in the Southern Baltic. Seven seal protection areas, established in 2001, limit passage rights and fishing within half a nautical mile of an islet or islet group. In other areas, professional fishers are allowed to employ trawling, fishing with thin-thread nets, fish traps, and fyke nets that do not let a seal enter the trap, as well as fishing-related transportation.

## Seals

The target of HELCOM recommendation 27-28/2, on conservation of seals in the Baltic Sea area, approved in 2002, is to ensure the viability of seals in the long term. The recommendation agrees on, for example, the general targets of population regulation, the to-be-established network of protective zones, and the minimisation of seal mortality due to fish traps.

In 2007, the Management Plan for the Finnish Seal Populations in the Baltic Sea was finalised (under the Ministry of Agriculture and Forestry). The management plan presents targets for population management. These targets include maintaining the viability of Finland's seal populations; reducing the harm caused by seals to livelihoods, via damage prevention and compensation; and managing seal populations such that they can be utilised in a sustainable and versatile way. In 2008, the Fishing Decree was amended to stipulate that the fyke nets used in salmon fishing are to be selective, seal-proof, and such as prevent seals ending up in by-catch. The aim of the management plan is to maintain seal populations of such levels as result in only a moderate amount of seal-caused damage, without compromising the population levels required by seal protection.

With decree 736/2001, approved by the Finnish government, Finland established seven grey seal protection areas, some of which are also included in the Natura 2000 network. In addition to the grey seal protection areas, other protection areas are significant to seal protection along the coast of Finland, such as Perämeri National Park and sections of the Archipelago Sea national park.

## 6. Marine Traffic

The HELCOM action plan sets six targets for operations at sea:

- no illegal emissions
- safe marine traffic without emissions due to disasters
- efficient readiness for combating oil spills and similar threats
- minimal sewage discharge
- no harmful invasive species
- minimal emissions to the air

Additionally, there are targets set for the environmental impact of oil production rigs and other structures at sea. The programme presents a set of measures implemented either through HELCOM co-operation or through the operations of the responsible contracting countries. In Finland, the recommendations are implemented mainly through marine and environmental legislation – specifically, with legislation on oil-combating.

Annex VI of the MARPOL Convention (73/78), the so-called air pollution annex, has been ratified, but ratifying its latest amendments requires further changes to Finnish legislation. The international AFS Convention, addressing ships' anti-fouling systems, will be ratified in the near future after the legislation of Åland has been amended (31 March 2010). Preparations are ongoing for the national strategy on invasive species, which should be complete by the end of 2010. The international Ballast Water Convention, or BMW, is in the process of being ratified. The HELCOM countries' joint submission on restricting sewage discharges from passenger ships was processed by the IMO's marine environment workgroup in March 2010, and this work will continue in the workgroup's next meeting, in the autumn.

Another key HELCOM protection plan recommendation concerns strengthened regional co-operation for readiness to combat oil and chemical spills. The BRISK project, on sub-regional risks of spill of oil and hazardous substances in the Baltic Sea, which is funded by the EU's Baltic Sea Region Programme (BSRP), has been initiated to implement the recommendation. The goal of BRISK is to promote adequate readiness to combat spills all across the Baltic. All HELCOM countries, as well as the HELCOM Secretariat, are involved in the project. The cleaning of oil-contaminated birds after oil spills is organised by the Finnish Environment Institute.

The further development of oil-combating technology continues at the Finnish Environment Institute. Finland's new multi-purpose oil-combating vessels are furnished with equipment that can detect oil slicks in the dark or when visibility is for other reasons poor. New equipment has also been developed for mechanical oil-combating in icy conditions. The operability of vessels in high surges is improved with a new technical solution that improves vessel stability. New vessels are equipped such that they can operate in chemical disaster areas. The Finnish Environment Institute and the Ministry of the Environment participate in the operations of

the spill-combating work group of the Arctic Council; the institute also monitors the development efforts of other players (for example, the signatory states of the Copenhagen protocol, Canada, and the USA) in oil-combating work in conditions of ice.

Air and satellite surveillance of oil spills is developed in co-operation with the European Maritime Safety Agency (EMSA). The full use of satellite images is made available to all countries in the Baltic Sea region. Harmonised satellite and air surveillance systems are being established for improved oil spill detection. The EMSA's oil spill detection system, called CleanSeaNet, has been operative since April 2007. All countries in the Baltic region, with the exception of Russia, are end users of this system. In 2009, Finland refitted the oil spill detection equipment of its surveillance aircraft. Helicopters are increasingly used in oil spill surveillance. EMSA satellite surveillance service complements other air surveillance. Cross-border surveillance flights have been agreed upon with Sweden and Estonia. Participation in the EU (DG MARE) project MARSUNO is aimed at unifying and boosting emission control all across the Baltic Sea and throughout the EU.

The automatic identification system (AIS) is another way of improving the environmental safety of marine traffic. The Baltic Sea AIS Trial (AISBaltic) project, focusing on identifying any deficiencies in the system and making improvement proposals, was implemented by the maritime authorities of Finland, Sweden, and Estonia, as well as Finland's Ministry of Transport and Communications, the Technical Research Centre of Finland, and the Finnish Environment Institute. Proceeding from the work of the project, the AIS system has been developed further in co-operation with the IMO. The results of the project will, in all likelihood, be approved within the context of the IMO's international AIS guidelines. The AIS+ continuation project, based on the results of AISBaltic, is currently in progress. The Finnish Transport Agency participates in the work of the International Association of Marine Aids to Navigation and Lighthouse Authorities, where the goal is to promote safe navigation on the Baltic Sea.

As a member of the International Hydrographic Organization (IHO), Finland has been a strong supporter of the IMO's initiative for mandatory ECDIS equipment (for electronic nautical charts). In 2009, the MSC approved mandatory implementation of ECDIS, to be carried out in phases for various types of vessels by 2018. The IHO reports annually to the IMO (in MSC and NAV meetings) on the status of ENC coverage. For the Baltic Sea, the IHO's coverage target has to a large extent been reached, and it will most probably be met fully this year. For Finland, this coverage target is one of the main 2010 results targets of the Finnish Transport Agency.

Finland has been an active participant in the renewal of hydrographic planning, in line with HELCOM's 2001 Copenhagen declaration, with the target of covering the full area of the Baltic Sea. In principle, this renewal has been approved by the IHO's Baltic Sea Hydrographic Commission,

and its implementation is ongoing. One target for the Finnish Transport Agency (in the field of hydrography) is to implement the general surveys that are most significant to marine traffic safety by the end of 2015. In merchant shipping, the goal is to complete the updating of the navigation-related technical data of fairways by the end of 2013.

## 7. The Archipelago Sea

The reduction needs defined for Finland in the HELCOM action plan are based solely on calculations conducted for the Gulf of Finland. The figures do not include reduction needs concerning the Archipelago Sea, as it has been left out of the calculations as a result of deficiencies in the model's separating capability. In the model calculations, it forms a part of the Bothnian Sea area, estimated to have already achieved a good marine environmental status, and therefore has no load reduction targets set. On the other hand, agriculture by the Archipelago Sea is Finland's only remaining so-called hot spot target where eutrophication-causing emissions are concerned. Consequently, Finland has announced that it will, in connection with the HELCOM action plan, reduce also the eutrophication-causing emissions of the Archipelago Sea with national measures.

The river basin management plan for Kokemäenjoki – the Archipelago Sea – the Bothnian Sea presents various measures for reducing eutrophying loads. Measures will be implemented throughout the river basin management area.

The most significant currently deployed *community* wastewater treatment measures include sewer network expansion, construction of new transfer sewers, six new treatment plants (to cover the entire river basin management area), treatment plant renewal and improved efficiency, and sewer renovation. The target is to include urban settlements within the scope of operations of water treatment plants. About 650 km of new transfer sewers and two new treatment plants are proposed as additional measures. Moreover, improvements should be made in the areas of environmental risk management, natural treatment of storm waters, and preparedness for disturbances. Reduction in the emissions from sparsely populated areas is done in accordance with the Decree on Treating Domestic Wastewater in Areas Outside Sewer Networks. For permanent settlements, it has been estimated that 70–80% of the wastewater systems need to be improved or connected to the sewer network. In addition, 20–30% of vacation homes are in need of improved water treatment efficiency. The opportunities for water treatment in sparsely populated areas must be considered in connection with water treatment development plans, so that settlements, specifically those that are close to urban areas and scattered along rivers, can be included within the scope of central water treatment.

Industrial emissions are regulated by the terms of environmental permits. Emission reduction is based on best available technologies. Environmental permits require several wastewater treatment measures on the part of industry.

Additional measures are also proposed for peat production and fur farming.

In the Archipelago Sea, fish farming has been a particular source of eutrophication. The environmental impact of fish farming has already been successfully and significantly reduced. Large fish farms need an environmental permit, which sets requirements regarding their operations. Sludge removal, the use of low-phosphorus feed, automated feeding, and the general observance of fish welfare are some of the measures aimed at load reduction. Furthermore, the load from fish farming should be reduced, especially in the areas with a poor environmental status. The action plan proposes measures and plans for regulating fish farm locations.

Agriculture is very much responsible for the loading of the Archipelago Sea, and in order for the sea to achieve a good ecological status, several additional measures in the field of agriculture are required. The measures are, by and large, the same as presented in the river Kymijoki – Gulf of Finland river basin management plans – i.e., control of nutrient emissions (through optimised fertilisation and utilisation of the nutrient reserves of cultivated fields), plant coverage in winter, protective zones, wetlands, and improved efficiency in manure processing. New water protection measures are also proposed for application in forestry.

In spite of all measures taken, the river basin management plan states that good water status cannot be achieved by 2021; instead, the target will be met by 2027. The Finnish government has decided to emphasise the importance of water protection in the Archipelago Sea. In line with the commitment made in the *Baltic Sea Action Summit* of 10 February 2010, the government is prepared to reduce eutrophication-causing emissions to the Archipelago Sea more rapidly than was envisioned in the river basin management plans, so that good status can be achieved already in 2020. To reach this end, a special work group is being set up to plan the measures needed specifically in agriculture. The planned deadline for the group's work is the end of February 2011.